

**REMARKS**

Claims 1-4 are pending in the application. All the pending claims have been rejected on new grounds in the Office Action mailed October 17, 2002. Applicant gratefully acknowledges the withdrawal of the rejections of the previous Office Action.

**I. Objection to the Title**

The Examiner has objected to the title of the application as not being sufficiently descriptive of the invention. The present amendment to the title of the application is believed to overcome this objection, and Applicant respectfully requests that it be withdrawn.

**II. The Claims Are Not "Product-By-Process" Claims**

As an initial matter, it appears that the examiner views the present claims as "product-by-process" claims. See, e.g., Office Action at 2 ("note that a 'product-by-process' claim is directed to the product per se ..."). Applicant wishes to point out that a product-by-process analysis is not appropriate with regard to the present claims, and it is believed that a fundamental underlying flaw in the pending rejections is due to the misreading of the claims as reciting a product-by-process.

None of claims 1-4 recite the claimed product in terms of the process by which it is made. Rather, there is reference to certain properties of certain components of the claimed laminates (the copper foils) under particular conditions (the heat generated by hot pressing). The reference to "heating for hot pressing" is no different from a reference to, for example, the solubility at "neutral pH" of a particular salt of a chemical used in a claimed process. The fact that the claimed process utilizing that chemical includes maintaining a neutral pH would not make such a claim a product-by-process claim. Likewise, the fact that certain elements of the presently claimed invention are

described in part in terms of their properties (recrystallization, contraction, Young's modulus) under a particular set of conditions does not make the present claims product-by-process claims. The use of functional language to define an element in a claimed combination is acceptable. *In re Swinehart*, 169 USPQ 226, 228 (C.C.P.A. 1971) (there is nothing intrinsically wrong with defining a claim element by what it does, rather than by what it is). The present amendments to claims 1-3 are intended to make this distinction clearer.

### **III. Rejection Under 35 U.S.C. §103(a) Over Kashiba, et al.**

Claims 1-4 have been rejected under 35 U.S.C. § 103(a) as being obvious over Kashiba, et al., U.S. patent No. 5,153,077 ("Kashiba"). The Patent Office asserts that Kashiba discloses "a copper clad laminate coated with copper foils of different thickness on both sides, wherein a first copper foil 2a on one side of said laminate is not recrystallizable by hot pressing for production of said laminate and a second foil 2b on the other side of [copper] recrystallizable by the hot pressing and thicker than said first foil." Office Action at 3. The Patent Office offers no further comment, explanation or reasoning in support of this rejection, other than citation to MPEP § 2113 (which relates to the patentability of product-by-process claims).

Applicant respectfully submits that the Patent Office has failed to establish a case of prima facie obviousness of the claimed invention. The burden of presenting a prima facie case of unpatentability resides with the Patent Office. In re Piasecki, 223 USPQ 785,788 (Fed. Cir. 1984). In presenting a prima facie case of unpatentability, the Patent Office must supply the factual basis for its rejection, and may not resort to speculation, unfounded assumptions or hindsight reconstruction merely because it may doubt that the invention is patentable. In re Warner, 154 USPQ 173, 178 (CCPA 1967). In order to establish

a case of prima facie obviousness, the Patent Office must show 1) that the prior art teaches or suggests all of the claimed limitations, 2) that there was a suggestion or motivation in the prior art to modify or combine reference teachings, and 3) that there was a reasonable expectation of success. MPEP § 706.02(j). With the present rejection, the Patent Office has failed to establish any of the three prongs necessary to support a rejection under § 103(a).

**A. Claim 1**

As the rejection applies to claim 1, the Patent Office has failed to show that the cited reference teaches or suggests the express claim limitation that "a first copper foil on one side of said laminate is not recrystallizable by hot pressing for production of said laminate and a second foil on the other side is recrystallizable by the hot pressing." Nowhere is there a discussion in Kashiba that the foil of the first side does or should possess the property of not being recrystallizable by hot pressing, or that the foil on the second side does or should possess the property of being recrystallizable under those same conditions. The Patent Office has cited no other source that would teach or suggest this. Thus, this element of the obviousness analysis has not been established.

The mere fact that one foil of the Kashiba composite substrate "might," or "could" be modified so as to be recrystallizable under hot pressing, while the second foil is not recrystallizable, does not make the claimed invention obvious, because the prior art does not suggest the desirability of making this modification. MPEP §706.02(j) ("the initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done"). The ceramic substrate of Kashiba is characterized by high rigidity and inflexibility, and thus would not generate any warping or distortion during production,

the problems which are addressed and overcome by the present invention. Rather, it is the object of the Kashiba invention to prevent flaws such as cracking the ceramic material caused by differential expansion and contraction of the ceramic and metallic layers of the composite. There is nothing in Kashiba that would motivate a person having ordinary skill in the art to modify the Kashiba composite (designed to eliminate cracking of the rigid substrate) in any way in order to prevent warping and distortion of the laminate as a whole, such as is achieved by the present invention, much less to make the specific modifications embodied in claim 1 (the foil of one side being recrystallizable, the foil of the other side not being recrystallizable under specific conditions). The examiner must explain "the specific understanding or principle with the knowledge of a skilled artisan that would motivate one with no knowledge of [the] invention to make the combination." In re Rouffet, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). Absent such specifics, the inference is that the examiner selected the references with the aid of impermissible hindsight. Id. The Patent Office has pointed to no source for motivation. Thus the motivation element of the obviousness analysis is not established.

Finally, even if a person of ordinary skill in the art were considering making the required modification of the Kashiba reference to obtain a copper clad laminate of claim 1, there is nothing in the Kashiba patent that would give an indication that such a modification would provide any advantage, much less overcome the specific problem resolved by the present invention. Again, the Patent Office has pointed to no other source that would provide this expectation. Thus, the necessary reasonable expectation of success is not established.

Because the cited Kashiba patent does not teach or suggest all of the limitations of claim 1, provides no suggestion or

motivation for making the necessary modifications to arrive at the invention of claim 1, and does not provide a basis for a reasonable expectation of success should such a modification be considered, a finding of obviousness under 103(a) cannot be supported as to claim 1.

**B. Claim 2**

As the rejection applies to claim 2, the Patent Office has again failed to establish any of the three prongs necessary to support a case of prima facie obviousness under § 103(a). Kashiba does not teach or suggest the express limitation of claim 2 that "said second copper foil is more recrystallizable by hot pressing and thicker than said first foil." While Kashiba could be interpreted to disclose two different foil layers of different thickness, as indicated above there is absolutely no teaching or suggestion of what would be desirable or useful recrystallization properties of such foils. Therefore, Kashiba does not teach or suggest every element of claim 2. Furthermore, for the reasons stated above with regard to claim 1, the remaining elements of the obviousness analysis are likewise not established with regard to claim 2. Because the Patent Office has failed to establish or support any of the elements of the case of prima facie obviousness, the rejection as applied to claim 2 cannot be supported.

**C. Claim 3**

With regard to claim 3, while Kashiba does discuss contraction properties (see column 6, lines 3-13), this is in reference to the difference between the contraction of the copper layers (i.e., both layers) and the ceramic substrate. There is no teaching or suggestion of the relevance of the contraction properties of the copper layers with regard to each other, which is the limitation found in claim 3 that "said second copper foil contracts more under heating for hot pressing and is thicker than

said first foil." Kashiba also provides no motivation to make the necessary modifications to arrive at the invention as embodied in claim 2, that the two copper layers have different contraction properties (specifically, that the thicker layer contracts more under heating for hot pressing). The Patent Office has indicated no other source for this motivation, creating the inference that improper hindsight was used, and so the second prong of the obviousness analysis is not established. In re Rouffet, supra. Finally, Kashiba provides no more expectation for the success of the specific modification necessary to arrive at the invention embodied in claim 3 than it does for that of claims 1 and 2, and the Patent Office has indicated no other source for such an expectation. Thus, as with claims 1 and 2, a case of prima facie obviousness is not supported as to claim 3.

**D. Claim 4**

The rejection as applied to claim 4 is no more supported than it is as applied to claims 1-3. Kashiba makes no reference to Young's modulus, nor indeed any reference to a difference in warping or distortion properties of the two copper foils found in the Kashiba laminate. Thus, the limitation of claim 4 that "said second copper foil has a lower Young's modulus and is thicker than said first foil" is neither taught nor suggested. Kashiba contains no disclosure that would motivate a person of ordinary skill in the art to make the modifications necessary to arrive at the invention as embodied in claim 4, a laminate with two copper layers having one layer with a lower Young's modulus and being thicker than the other, nor has the Patent Office indicated any other source of such motivation, creating the inference that improper hindsight was used in making the rejection. In re Rouffet, supra. There is nothing in the Kashiba reference that would provide a person of ordinary skill in the art with an

expectation of success should such a modification be made, and the Patent Office has pointed to no other source for such an expectation. Thus, the Patent Office has entirely failed to establish a case of prima facie obviousness with regard to claim 4, and this rejection cannot be supported as applied to claim 4.

In view of the foregoing, Applicant respectfully requests that the rejection of claims 1-4 as being obvious over Kashiba be reconsidered and withdrawn.

#### **IV. Rejection Under 35 U.S.C. §103(a) Over Maeda, et al.**

Claims 1-4 have also been rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeda et al., U.S. patent No. 4,751,146 ("Maeda"). As with the Kashiba reference, the Patent Office simply asserts that Maeda shows "a copper clad laminate coated with copper foils of different thickness on both sides, wherein a first copper foil 1 on one side of said laminate is not recrystallized by hot pressing for production of said laminate and a second foil 9 on the other side of [sic, is] recrystallizable by hot pressing and thicker than said first foil." Office Action at 3.

As with the preceding rejection over Kashiba, the Patent Office has failed to provide support for any of the three prongs necessary to establish a case of prima facie obviousness over Maeda. The case law, statutes and regulations applicable to this rejection are the same as those detailed above with regard to Kashiba, and in the interest of brevity will not be repeated here. Similar to Kashiba, Maeda contains no teaching of the recrystallization properties of the metallic layers of the disclosed printed circuit boards. Thus, Maeda neither teaches nor suggests the limitations of claims 1 and 2 reciting recrystallization properties of the copper foils, nor does it teach or suggest the relative degree of contraction of the two

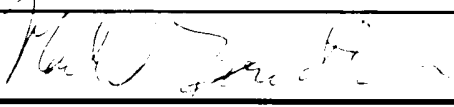
layers under heating such as occurs during hot pressing. Finally, there is no discussion or suggestion in Maeda of the importance of Young's modulus and the relative value thereof of the two copper layers. In fact, the solutions presented by Maeda focus almost exclusively on the nature of the polymeric laminate body (see, e.g., col. 4, line 64 to col. 5, line 23) and not on the nature of the metallic layers. Thus, Maeda suffers from the same deficiencies as Kashiba, and there is nothing in the Office Action by way of evidence or reasoning that would make up these deficiencies. Because Maeda does not teach or suggest every limitation of the claims, provides no motivation for making the necessary modifications to achieve the claimed invention, and offers no basis for a reasonable expectation of success with such modification, and because the Patent Office has neither supplied nor indicated any source in the prior art where these can be found, this rejection is not supported. Applicants respectfully request that it be reconsidered and withdrawn.

#### **CONCLUSION**

In view of the foregoing, Applicant submits that the Patent Office has failed to establish the prima facie obviousness of claims 1-4 over either the Kashiba patent or the Maeda patent, and that neither reference in fact provides any support for such a rejection. Applicant submits therefore that the rejection of claims 1-4 over Kashiba and over Maeda is not proper, and respectfully requests that these rejections be reconsidered and withdrawn. Favorable action on the claims is earnestly solicited.

Please note the change in the correspondence address for this application. A change of address and supplemental power of attorney document, accompanies this submission.



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**Attachments:** Marked-up Copies of Amendments

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**Amended Claims: Version with markings to show changes made**

1. A copper clad laminate coated on both sides with copper foils of different thicknesses ~~on both sides~~, wherein a first copper foil on one side of said laminate ~~is not~~ has the property of not being recrystallizable ~~by hot pressing for production of said laminate~~ under the conditions that exist during a hot pressing step in the manufacture of said laminate, and a second foil on the other side ~~is~~ of said laminate that has the property of being recrystallizable ~~by the hot pressing~~ under the conditions that exist during a hot pressing step in the manufacture of said laminate and is thicker than said first foil.
2. A copper clad laminate coated on both sides with copper foils of different thicknesses ~~on both sides~~, with a first copper foil on one side of said laminate and a second foil on the other side of said laminate, wherein said second ~~copper foil is~~ has the property of being more recrystallizable ~~by hot pressing and~~ than said first foil under the conditions that exist during a hot pressing step in the manufacture of said laminate, and wherein said second foil is thicker than said first foil.
3. A copper clad laminate coated on both sides with copper foils of different thicknesses ~~on both sides~~, with a first copper foil on one side of said laminate and a second foil on the other side of said laminate, wherein said second ~~copper foil contracts more under heating for hot pressing~~ and has the property of contracting more than said first foil under the conditions that exist during a hot pressing step in the manufacture of said laminate, and wherein said second foil is thicker than said first foil.